

TITLE OF THE INVENTION

IMPROVED CABLE FEEDING DEVICE

BACKGROUND OF THE INVENTION

This invention relates to the field of home and commercial drain cleaning machinery, in particular mechanisms for advancing and retracting a cable snake drain cleaner.

Typical drain cleaning snakes are portable, electric-motor-driven mechanisms that pass a long articulated cable down a plumbing fixture to and through the sewer line. The intent is to use the sharp blades at the end of the rotating snake cable to slice through roots and other obstructions that periodically clog and stop drain pipes.

There are several previous inventions of a similar nature that provide feed control mechanisms for the snake, notably, U.S. Patent No. 5,901,401 to Rutkowski and No. 5,507,062 and 5,239,724 to Salecker. The technology of controlling the direction of the snake

cable and changing the motion of the cable by means of a set of rollers and control levers is well known.

The direction control mechanisms of these previous snake feeders are, in general, complex and possess multiple parts and

5 connectors. There is an advantage to minimizing the number of moving parts and control levers to control the snake cable direction, and these earlier inventions make more or less successful attempts to achieve this advantage. The parts disposed in the interior of the cable feeder are regularly exposed to water and

10 sewage, which leads to corrosion and rust. When the corrosion and rust reached a certain level in the feeder, it must be broken down and cleaned, or if that is not possible because of its construction, then it must be replaced. A cable feeder with the minimum number of moving parts and components exposed to the plumbing

15 environment is the preferred implementation.

BRIEF SUMMARY OF THE INVENTION

- The cable feeder of this invention is a simple metallic framework with a minimum of moving parts that provides a
- 5 centrally disposed opening through which a snake cable passes.
- This opening is sizeable by means of an adjustment mechanism and possesses a set of three rollers that grip the cable. The rollers are canted in such a fashion that they grip the cable and allow it to advance or reverse depending on a position set by a control lever.
- 10 The control lever turns a face plate covering the main body of the invention. The rotating face plate adjusts three cams, one cam per roller, that alters the roller position. This technology is well-known.
- The advancement offered by this invention resides in the
- 15 simplicity of its construction and the reduced number of moving parts. Competing designs of similar cable controllers are

fundamentally hollow, flat cylinders that have many moving parts to control the cable direction. The present invention is a single piece main body and a single piece face plate. The main body has circumferential piston holes drilled through from the outer edge 5 that contain the cams and the cams control the rollers through the pistons holes. The guide hole for the cable is sized by means of an adjustment screw, attached to one of the pistons.

BRIEF DESCRIPTION OF THE DRAWINGS

10 The construction and operation of the invention can be readily appreciated from inspection of the drawings that accompany this application.

Figure 1 is a perspective view of the invention.

Figure 2 is a front cross-section of the invention.

15 Figure 3 is cross-section of one of the cams in reverse control position

Figure 4 is cross-section of one of the cams in neutral control position

Figure 5 is cross-section of one of the cams in forward control position

5 Figures 6A, 6B, and 6C are an exploded diagram of the invention

DETAILED SPECIFICATION

Referring to Fig. 1, The cable guide¹⁰⁰ consists of a circular faceplate¹⁰¹, a main body¹⁰², an adjustment screw handle¹⁰⁸, a control handle¹⁰⁹, a plurality of piston screws¹⁰³, a plurality of 5 piston screw access holes¹⁰⁴ in the faceplate¹⁰¹, a connection screw¹⁰⁵, a lock ring¹⁰⁶, and a cable guide hole¹⁰⁷. Referring to Figs 6A, 6B, and 6C, the internal workings of the invention are revealed. In Fig. 6B, the piston holes¹¹⁰, cable guide hole¹¹¹, piston hole plate settings¹¹², cam screw holes¹¹³, and connection 10 screw¹⁰⁵ are shown.

In Fig. 6C, the arrangement of the pistons¹¹⁶ can be seen. One piston¹¹⁶ has an adjustment screw handle¹⁰⁸ inserted through the piston faceplate¹¹⁴ and removably inserted into the top of the piston¹¹⁶, the faceplate¹¹⁴ removably attached to the main 15 body¹⁰². The remaining pistons¹¹⁶ have a piston faceplate¹¹⁴ removably attached to the main body¹⁰², but with a ball bearing

recess¹¹⁵ in the main body under the piston faceplate¹¹⁴. Between the piston faceplate¹¹⁴ and the top of the piston¹¹⁶ is a spherical ball bearing¹¹⁷ that helps the circular faceplate¹⁰¹ turn when the control handle¹⁰⁹ is grasped and the circular faceplate¹⁰¹ is turned 5 around the cable guide hole¹⁰⁷. This assembly prevents an air-tight seal and also prevents the piston assembly from drying out and becoming unlubricated.

At each piston central end¹²⁰ are cable guide cams¹²¹ that engage the cable. The manner in which the cable guide cams¹²¹ 10 engage the cable is adjusted by the turning of the pistons¹¹⁶ by means of rotating the circular faceplate¹⁰¹ around the cable guide hole¹⁰⁷. As the circular faceplate¹⁰¹ is rotated, the three piston screws¹⁰³ attached fixedly to the pistons¹¹⁶ move slightly left or right to the ends of the travel afforded by the cam screw access 15 holes¹¹³.

At one end of the travel, each piston¹¹⁶ is rotated such that the cable guide cams¹²¹ engage the cable in such a manner that the cable can advance through the cable guide hole¹⁰⁷. At the other end of the travel, the cams¹²¹ are positioned by the pistons¹¹⁶ to 5 enable the cable to only be reversed in direction.

In Fig. 2, the entire mechanism is seen in cross-section. Shown in this figure is the transverse grease fitting¹³⁰ and the circumferential grease fitting¹³¹, These fittings are used to lubricate the invention. Fig. 3, 4, and 5 show how the rotation of the circular face plate¹⁰¹ moves the piston screws¹⁰³ within the cam screw holes¹¹³ such that the pistons¹¹⁶ rotate in the desired direction. In 10 Fig. 3, the mechanism supports reverse movement of the cable, in Fig. 4 the mechanism is in neutral position, and in Fig. 5 the cable will move in the forward direction.

While the foregoing describes a preferred embodiment, variation on this design and equivalent designs may be resorted to in the scope and spirit of the claimed invention.